

**AMENDMENTS TO THE CLAIMS**

Please amend the claims as follows.

1. (Currently Amended) A method for providing verification for a simulation design, comprising:
  - obtaining the simulation design comprising a programming language interface system call;
  - ~~encoding a target of~~ obtaining a reference value corresponding to the programming language interface system call;
  - encoding the reference value into the simulation design to obtain a first modified simulation design[[]], comprising:
    - obtaining a set of hardware state elements from the simulation design;
    - obtaining a set of high-level state elements from a high-level design;
    - determining a common set of state elements from the set of hardware state elements and the set of high-level state elements;
    - identifying at least one relationship between the high-level state element and the hardware state element in the common set of state elements;
    - determining whether the at least one relationship is influenced by a test vector to obtain an influenced set of relationships; and
    - encoding the influenced set of relationships to obtain the modified simulation design;
  - ~~modifying the programming language interface system call to reference the target in the first modified simulation design to obtain a second modified simulation design; and~~
  - compiling the modified simulation design to obtain a compiled simulation design; and
  - ~~verifying the second modified compiled simulation design using a simulation testbench test bench.~~
  
2. (Original) The method of claim 1, wherein the simulation design comprises a register transfer level design.

3. (Cancelled)
4. (Currently Amended) The method of claim [[3]] 1, wherein encoding the influenced set of relationships comprises:  
obtaining high-level state element values for the high-level state elements in the influenced set of relationships from a simulation of the high-level design; and  
storing the high-level state element values in an array, wherein at least one of the high-level state element values is the reference value.
5. (Cancelled)
6. (Currently Amended) The method of claim [[3]] 1, wherein the ~~hardware~~ high-level state element comprises at least one from the group consisting of a processor register and a memory.
7. (Currently Amended) The method of claim [[3]] 1, wherein the ~~high-level~~ hardware level state element comprises at least one from the group consisting of a flip-flop, a latch, and a memory.
8. (Currently Amended) The method of claim [[3]] 1, wherein the relationship comprises at least one of the group consisting of a one-to-one relationship, a one-to-many relationship, and a relationship defined by a mathematical function.
9. (Currently Amended) The method of claim 1, wherein the ~~second-modified hardware-level~~ compiled simulation design is verified on a hardware-based simulation test bench.
10. (Currently Amended) A computer system for providing verification for a simulation design, comprising:  
a processor;  
a memory;  
a storage device; and  
software instructions stored in the memory for enabling the computer system to perform:

obtaining the simulation design comprising a programming language interface system call;  
~~encoding a target of~~ obtaining a reference value corresponding to the programming language  
 interface system call;  
encoding the reference value into the simulation design to obtain a ~~first~~ modified simulation  
 design[[]], comprising:  
obtaining a set of hardware state elements from the simulation design;  
obtaining a set of high-level state elements from a high-level design;  
determining a common set of state elements from the set of hardware state elements  
and the set of high-level state elements;  
identifying at least one relationship between the high-level state element and the  
hardware state element in the common set of state elements;  
determining whether the at least one relationship is influenced by the test vector to  
obtain an influenced set of relationships; and  
encoding the influenced set of relationships to obtain the modified simulation design;  
~~modifying the programming language interface system call to reference the target in the first~~  
~~modified simulation design to obtain a second modified simulation design; and~~  
compiling the modified simulation design to obtain a compiled simulation design; and  
~~verifying the second modified~~ compiled simulation design using a simulation ~~testbench~~ test  
bench.

11. (Currently Amended) The computer system of claim 10, wherein the simulation design comprises a ~~resistor~~ register transfer level design.
12. (Cancelled)
13. (Currently Amended) The computer system of claim [[12]] 10, wherein encoding the influenced set of relationships comprises:  
 obtaining high-level state element values for the high-level state elements in the influenced set of relationships from a simulation of the high-level design; and

storing the high-level state element values in an array, wherein at least one of the high-level state element values is the reference value.

14. (Cancelled)
15. (Currently Amended) The computer system of claim [[12]] 10, wherein the ~~hardware~~ high-level state element comprises at least one from the group consisting of a processor register and a memory.
16. (Currently Amended) The computer system of claim [[12]] 10, wherein the ~~high-level~~ hardware state element comprises at least one from the group consisting of a flip-flop, a latch, and a memory.
17. (Currently Amended) The computer system of claim [[12]] 10, wherein the relationship comprises at least one of the group consisting of a one-to-one relationship, a one-to-many relationship and a relationship defined by a mathematical function.
18. (Currently Amended) The computer system of claim 10, wherein the ~~second-modified hardware-level~~ modified simulation design is verified on a hardware-based simulation test bench.
19. (Cancelled)
20. (Currently Amended) Apparatus providing verification for a simulation design, comprising:  
 means for obtaining the simulation design comprising a programming language interface system call;  
 means for ~~encoding a target of~~ obtaining a reference value corresponding to the programming language interface system call;  
means for encoding the reference value into the simulation design to obtain a first modified simulation design[;], comprising:  
means for obtaining a set of hardware state elements from the simulation design;  
means for obtaining a set of high-level state elements from a high-level design;

means for determining a common set of state elements from the set of hardware state elements and the set of high-level state elements;

means for identifying at least one relationship between the high-level state element and the hardware state element in the common set of state elements;

means for determining whether the at least one relationship is influenced by a test vector to obtain an influenced set of relationships; and

means for encoding the influenced set of relationships to obtain the modified simulation design;

~~means for modifying the programming language interface system call to reference the target in the first modified simulation design to obtain a second modified simulation design; and~~

means for compiling the modified simulation design to obtain a compiled simulation design; and

means for verifying the ~~second modified~~ compiled simulation design using a simulation ~~testbench~~ test bench.

21. (New) The apparatus of claim 20, wherein the simulation design comprises a register transfer level design.
22. (New) The apparatus of claim 20, wherein encoding the influenced set of relationships comprises:
  - means for obtaining high-level state element values for the high-level state elements in the influenced set of relationships from a simulation of the high-level design; and
  - means for storing the high-level state element values in an array, wherein at least one of the high-level state element values is the reference value.